

II. Amendments to Claims:

Listing of Claims:

1. (currently amended) A multi-axis input transducer apparatus comprising:
 - an at least quinary input element capable of receiving input with respect to at least five frames of reference,
 - a reflective element~~-responsive to that, during receipt of said input, reflects~~ radiation from a source capable of emitting radiation eventually incident upon said reflective element; ~~and~~
 - at least one reflected radiation detector ~~responsive to that detects~~ radiation from said reflective ~~element~~ element; and
 - a comparatively non-reflective element upon which radiation from said source is eventually incident,

wherein said comparatively non-reflective element forms at least one abrupt border with said reflective element, where there is an abrupt change from reflective to comparatively non-reflective.
2. (currently amended) The multi-axis input transducer apparatus as described in claim 1 wherein said at least quinary input element comprises an at least sextet input element capable of receiving input with respect to at least six frames of reference.
3. (canceled)
4. (canceled)
5. (original) The multi-axis input transducer apparatus as described in claim 1 wherein said source of radiation comprises a source of electromagnetic radiation.

6. (canceled)
7. (original) The multi-axis input transducer apparatus as described in claim 1 wherein said at least five frames of reference comprises at least three translational frames of reference.
8. (original) The multi-axis input transducer apparatus as described in claim 1 wherein said at least five frames of reference comprises at least three rotational frames.
9. (original) The multi-axis input transducer apparatus as described in claim 1 wherein said at least five frames of reference comprise three translational frames of reference and two rotational frames of reference.
10. (canceled)
11. (canceled)
12. (canceled)
13. (canceled)
14. (original) The multi-axis input transducer apparatus as described in ~~claim 13~~ claim 1 wherein said at least one abrupt border comprises at least two abrupt borders.
15. (original) The multi-axis input transducer apparatus as described in claim 14 wherein said at least two abrupt borders comprises at least two substantially orthogonal abrupt borders.
16. (canceled)

17. (canceled)

18. (currently amended) The multi-axis input transducer apparatus as described in ~~claim~~
17 claim 14 wherein said at least two abrupt borders zig zag.

19. (original) The multi-axis input transducer apparatus as described in claim 1 wherein
said reflective element is established extra-radially of said source.

Claims 20-22 canceled.

23. (original) The multi-axis input transducer apparatus as described in claim 1 wherein
said at least quinary input element comprises a joystick.

24. (original) The multi-axis input transducer apparatus as described in claim 1 wherein
said reflective element comprises an annular reflective element.

Claims 25-30 canceled.

31. (currently amended) A joystick comprising a radiation source, ~~a reflector that~~
projects radiation eventually incident upon an internal reflector that itself reflects
a varying reflected optical signal to a reflected radiation sensor in a manner which
varies in at least four degrees of freedom in response to varying input from an
operator, wherein said reflected radiation sensor senses at least a portion of said
varying reflected optical signal wherein ~~and~~ ~~reflected radiation sensor, at least~~
~~one of which is~~ said radiation source and said reflector are movable with respect
to at least one each other ~~of said three elements~~ in at least three four degrees of
freedom, wherein said radiation source projects radiation eventually incident upon
said reflector, said reflector reflects a varying reflected optical signal to said
reflected radiation sensor in a manner which varies in at least three degrees of
freedom, and said reflected radiation sensor senses at least a portion of said
varying reflected optical signal and wherein said reflector comprises multiple

reflective facets.

32. (currently amended) A joystick as in claim 31 wherein said ~~source of radiation~~
source comprises a visible light ~~source of radiation~~ source.

33. (canceled)

34. (canceled)

35. (currently amended) The joystick of claim 31 wherein the ~~returned~~ varying reflected
optical signal is detected as an image incident on an array of image sensing
elements.

36. (canceled)

37. (canceled)

38. (original) The joystick of claim 31 wherein said reflected radiation sensor comprises
a photo detector and the radiation source comprises time sequenced light emitters.

Claims 39-100 (canceled).

101. (currently amended) A multi-axis joystick comprising:
a finger operable first portion at least quiaxially ~~responsively~~ movably connected
to a second portion; and a hand operable second portion at least uniaxially
~~responsively~~ movably connected to a third portion, each movable connection
generating a signal in response to relative movement.

Claims 102-120 (canceled).

121. (newly added) A multi-axis input transducer apparatus comprising:

- an at least quinary input element capable of receiving input with respect to at least five frames of reference; and

- an internal reflective element established:

(a) so that said input causes movement of said internal reflective element relative to a radiation source; and

(b) to receive input independent radiation from said radiation source,

wherein said radiation source is capable of emitting radiation eventually incident upon said internal reflective element, and

wherein said at least one reflected radiation detector is established to receive radiation reflected by said internal reflective element.

122. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said at least quinary input element comprises an at least sextet input element capable of receiving input with respect to at least six frames of reference.

123. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said source comprises a source of electromagnetic radiation.

124. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said at least five frames of reference comprises at least three translational frames of reference.

125. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said at least five frames of reference comprises at least three rotational frames.

126. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said at least five frames of reference comprise three translational frames

of reference and two rotational frames of reference.

- 127. (newly added) The multi-axis input transducer apparatus as described in claim 121 further comprising a comparatively non-reflective element upon which radiation from said source is eventually incident.
- 128. (newly added) The multi-axis input transducer apparatus as described in claim 127 wherein said comparatively non-reflective element forms at least one abrupt border with said internal reflective element, where there is an abrupt change from reflective to comparatively non-reflective.
- 129. (newly added) The multi-axis input transducer apparatus as described in claim 128 wherein said at least one abrupt border comprises at least two abrupt borders.
- 130. (newly added) The multi-axis input transducer apparatus as described in claim 129 wherein said at least two abrupt borders comprises at least two substantially orthogonal abrupt borders.
- 131. (newly added) The multi-axis input transducer apparatus as described in claim 129 wherein said at least two abrupt borders zig zag.
- 132. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said reflective element is established extra-radially of said source.
- 133. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said at least quinary input element comprises a joystick.
- 134. (newly added) The multi-axis input transducer apparatus as described in claim 121 wherein said reflective element comprises an annular reflective element.
- 135. (newly added) The multi-axis input transducer apparatus as described in claim 121

wherein said reflective element is further established so that said input causes movement of said internal reflective element relative to at least one reflected radiation detector.

136. (newly added) A multi-axis input transducer apparatus comprising:

- an at least quinary input element capable of receiving input with respect to at least five frames of reference; and
- an annular reflective element established to receive input independent radiation from said radiation source,

wherein said radiation source is capable of emitting radiation eventually incident upon said annular reflective element,

wherein said at least one reflected radiation detector is established to receive radiation reflected by said annular reflective element, and

wherein said annular reflective element is established so as to surround said radiation source.

137. (newly added) The multi-axis input transducer apparatus as described in claim 136 further comprising a comparatively non-reflective element upon which radiation from said source is eventually incident.